IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application. An identifier indicating the status of each claim is provided.

Listing of Claims:

1. (Currently Amended) A near field microscope comprising:

a wave source, which emits a wave with a variable frequency;

a waveguide resonator through which the wave emitted from the wave source propagates;

a probe, which perforates an outer wall of the waveguide resonator and by which the wave that propagates through the waveguide resonator interacts with a sample; and

a detector, which detects the wave that has interacted with the sample,

wherein an impedance, a resonance frequency mode and a structure of the probe can be controlled in the waveguide resonator.

2. (Original) The near field microscope of claim 1, further comprising a tuner, which is movably connected to one end of the waveguide resonator and adjusts a length of the waveguide resonator.

3. (Original) The near field microscope of claim 1, wherein a portion of the probe inside the waveguide resonator has a linear shape.

4. (Original) The near field microscope of claim 1, wherein a portion of the probe inside the waveguide resonator has a loop shape.

5. (Original) The near field microscope of claim 1, wherein a probe portion outside the waveguide resonator has a linear shape or a loop shape.

6. (Original) The near field microscope of claim 1, wherein the probe is formed of metal, a dielectric material, or a magnetic substance.

7. (Original) The near field microscope of claim 4, wherein when H_0 is a maximum value of a magnetic field perforating the portion of the probe inside the waveguide resonator, p is a p-value in a TE_{10P} mode, z_i is a position of a front end of the portion of the probe inside the waveguide resonator, z_f is the position of a rear end of the portion of the probe inside the waveguide resonator and d is a length of the waveguide resonator, a magnitude of an electromotive force generated in the probe is given by:

$$V = \_\frac{\mu_0 \omega\ a\ y\ H_0}{\pi} [\ 2 \cos 1/2\ \{\ (p\ \pi)\ /d\ (\ z_f + z_i\ )\ \}\ \sin 1/2\ \{\ (p\ \pi\ )/d\ (\ z_f - z_i\ )\ \}\ ]\ .$$

8. (Original) The near field microscope of claim 7, wherein the probe is disposed in a position that satisfies z_f=3d/2p, z_i=d/2p.

9. (Original) The near field microscope of claim 5, wherein a slit is formed in the waveguide resonator, and the probe is movable along the slit.

10. (Original) The near field microscope of claim 1, wherein when a width of a cross-section of the waveguide resonator is a, a height of the waveguide resonator is b, and m and n are integers, a cut-off frequency f_{cmn} of the waveguide resonator is given by:

$$f_{cmn} = [\, 1 / [2\pi \sqrt{\mu\varepsilon}\,]\,] \sqrt{(m\pi/a)^2 + (n\pi/b)^2},$$

and a wave with a frequency greater than the cut-off frequency is used.

11. (Original) The near field microscope of claim 1, wherein, when a resonance frequency and a volume before the probe is inserted into the waveguide resonator are f_0 and v_0, respectively, and a change in volume of the probe after the probe is inserted into the waveguide resonator is Δv, a change in resonance frequency f of the waveguide resonator is given by:

$$[f - f_0] / f_0 = -2\,\Delta v. / v_0$$

12. (Original) The near field microscope of claim 1, wherein the probe is a hybrid probe manufactured using partial two-step etching.

13. (Original) The near field microscope of claim 1, further comprising a lock-in amplifier, which minimizes noise by improving a signal-to-noise ratio between the wave source and the waveguide resonator.

14. (Original) The near field microscope of claim 1, wherein the wave source emits microwaves or millimeter-waves.

15. (Original) The near field microscope of claim 1, wherein when a wavelength of the wave emitted from the wave source is .lambda., the length of the waveguide resonator changes by .lambda./4 increments.

16. (Original) The near field microscope of claim 4, wherein the probe portion having the loop shape is disposed parallel to an advancing direction of the wave.